Design and Implementation of a World Wide Web Accessible Database for the Swedish ICD-10 Primary Care Version Using a Concept System Approach

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Background. Sweden, in contrast to most other European countries, has a tradition of using adjusted versions of the International Classification of Diseases (ICD) within primary health care. Along with the Swedish version of the tenth revision (ICD-10), a primary health care classification has been developed together with an additional three-dimensional system for classification of diagnoses according to location, origin, and type. This abstract describes the development of the classification and how additional value is created with the help of a concept representation system in a World Wide Web (WWW) accessible computer application.

Material and Methods. As a part of the process of developing and analyzing an extended conceptual model of diseases, a retrospective study of medical records was undertaken within a network of seven health centers. The objective was to develop a new classification which would reflect common diagnoses as well as symptoms. Recommendations for terminology work were considered,[1,2] and an experienced terminologist was consulted during the initial phases.

The concept representation system was implemented by means of a data model developed within the Spriterm project.[3] It enables representation of hierarchical as well as semantic relations such as rules for relative priority within the classification.

Results. The new codes correspond to either the three or four character level of the ICD-10. Closely related diagnoses have been aggregated into common joint diagnoses marked with a "P" in the code, and unusual diagnoses have been added to less specified residual groups marked in the same way. The total number of categories (disparate diagnoses) is 973, i.e. approximately one tenth of the contents of the ICD-10.

Entities corresponding to disparate levels of the classification were implemented as concepts within the model, and terms were assigned a "used as" property to reflect their usage within it. These can, for instance, be preferred terms, diagnostic codes, or chapter titles.

Meaningful dimensions of state of health were explored and highest priority was given to *location*,

origin, and *type*. A corresponding hierarchical and combinatory concept representation system was developed based on these dimensions, which cover the most essential aspects of the existence of the parts of an arbitrary process, that is *where*, *how*, and *what*. They provide useful descriptions of patients as well as medical practice.

Code selections suitable for medical audit and quality assurance, such as identification of encounters with *respiratory tract infections*, *musculoskeletal symptoms*, and *infectious diseases*, could be done with combinations of concepts. These combinations could be performed without respect to the structure of the original classification.

Discussion. The new classification may promote quality in diagnostic coding with added value in medical audit and epidemiological studies. A major advantage of the computerized version is that the concept hierarchy is code-independent; thus it is possible to rebuild its structure if necessary.

It is also possible to include mappings not only to the ICD-10, but to any coding scheme. Furthermore, the concept representation system may supply connections to hypertext-oriented knowledge bases, such as those containing diagnostic criteria.

Support for poly-hierarchy is essential with respect to the ongoing implementation of the three-dimensional concept space. However, the new classification needs to be carefully revised and evaluated from a long term perspective within primary health care.

References

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